DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the substrate processing system incorporating the substrate processing device and such a substrate processing device which convey a semiconductor substrate, the glass substrate for liquid crystal displays, the glass substrate for photo masks, the substrate for optical discs (a "substrate" is only called hereafter), etc. among two or more handling units.
[0002]
[Description of the Prior Art]Products, such as a semiconductor and a liquid crystal display, are manufactured by performing many processings of series, such as washing, a resist application, exposure, development, etching, formation of an interlayer insulation film, heat treatment, and dicing, to a substrate. Conventionally, in the substrate processing device installed in the clean room, many above-mentioned processings are performed, in order to prevent the particles (what is called particle) which float in the air from adhering to a substrate. The substrate processing device has attained a series of substrate treatment by conveying a substrate between various processing units with the carrier robot which provided the liquid treatment unit and heat treatment units for performing the above-mentioned various processing in the carrying path in two or more preparations and a device.
[0003]On the other hand, the minuteness making of the pattern formed in a semiconductor device etc. and complication are progressing remarkably, and substrate treatment under purer environment is desired in recent years. In the excimer responding device exposed by excimer laser to the substrate which applied chemical amplification type resist especially, it is necessary to prevent mixing of alkali atmosphere (specifically ammonia atmosphere) as much as possible. For this reason, while raising the cleanliness in a device from clean room environment by forming a filter in the device upper part and supplying a clean air in a device with a blower fan in a substrate processing device in recent years, Furthermore the device upper part is equipped also with a chemical-absorption filter, and ammonia atmosphere is kept from flowing in a device.
[0004]The space of the limited clean room from a viewpoint used effectively. Reduction of the footprint (flat-surface area which a device occupies) of a substrate processing device is also desired, and vertical mold-ization of what is called a device which constitutes a substrate processing device is also progressing by laminating to multistage the handling unit which performs various kinds of above-mentioned processings.
[0005]
[Problem(s) to be Solved by the Invention]However, in the former, the balance of the amount of supply of the clean air in a substrate processing device and the displacement from each handling unit or a carrying path is not managed, The inside of a device became negative pressure and the problem that atmosphere (clean room atmosphere) of the device exterior containing particle could not mix in a device, or a good downflow could not be formed in a carrying path with the device of the vertical mold with which especially the handling unit was laminated by multistage had arisen. In the latest substrate treatment art, the phenomenon in which clean room atmosphere flows in a device is one of the having to avoid most.
[0006]In light of the above-mentioned problems, this invention is a thing.
the purpose is to provide the substrate processing device which can be boiled and maintained.

[0007]
[Means for Solving the Problem]In order to solve an aforementioned problem, an invention of

claim 1, In a substrate processing device provided with two or more handling units and a carrier robot which is stationed at a carrying path and conveys a substrate among said two or more handling units, Said whole device is equipped with an air supply means which supplies defecation air, and defecation air is made to supply by the amount of supply more than sum total displacement exhausted by said air supply means from all and said carrying path of two or more of said handling units.

[0008]In a substrate processing device concerning an invention of claim 1, an invention of claim 2 is including a warming unit which heat-treats to a substrate, a refrigeration unit which performs a cooling process to a substrate, and a liquid treatment unit which performs liquid treatment to a substrate in said two or more handling units.

[0009]In a substrate processing device which an invention of claim 3 requires for an invention of claim 1 or claim 2, Each and said carrying path of two or more of said handling units are made to open for free passage, defecation air is supplied to said carrying path, and said air supply means is made to make atmospheric pressure in said carrying path more than atmospheric pressure in each of two or more of said handling units.

[0010]In a substrate processing system provided with a substrate processing device which requires an invention of claim 4 for an invention of claim 3, and an indexer which receives a processed substrate from said substrate processing device while paying out an unsettled board to said substrate processing device, Said carrying path and said indexer are opened for free passage and atmospheric pressure in said indexer is made lower than atmospheric pressure in each of two or more of said handling units.

[0011]In a substrate processing system which an invention of claim 5 requires for an invention of claim 4, Have further an interface which delivers a substrate between said substrate processing device and an exposure machine, said interface is made to open for free passage on both sides of said indexer and said carrying path, and atmospheric pressure in said interface is made higher than atmospheric pressure in each of two or more of said handling units.

[0012]In a substrate processing system concerning an invention of claim 5, an invention of claim 6 makes atmospheric pressure in said exposure machine higher than atmospheric pressure in said interface.

[0013]In a substrate processing system concerning one invention of claim 4 to claims 6, while touching a clean room passage through which a carrying device which carries a substrate passes, an invention of claim 7 said indexer, It is open for free passage with the clean room passage concerned, and atmospheric pressure in said clean room passage is made it is higher than atmospheric pressure in said indexer, and lower than atmospheric pressure in each of two or more of said handling units.

[0014]In a substrate processing system concerning one invention of claim 4 to claims 7, an invention of claim 8 makes atmospheric pressure in an operation room for operating the substrate processing system concerned lower than atmospheric pressure in said indexer.

[0015]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described in detail, referring to drawings.

[0016]<Composition of 1. substrate processing device> drawing 1 is a top view showing typically the example of a unit arrangement configuration of the substrate processing device concerning this invention. Drawing 2 is the side view which looked at the substrate processing device of drawing 1 from direction of arrow AR1. This substrate processing device 1 is a device which performs heat treatment which accompanies a substrate at resist application processing, a development, and them, and is a device installed in a clean room. The XYZ orthogonal coordinate system for clarifying those directional relation is given to each figure of drawing 1 and the following. In this XYZ orthogonal coordinate system, an XY plane is the level surface

and a Z direction is the perpendicular direction.
[0017]As shown in drawing 1, as the substrate processing device 1 put the carrying path 10 which has stationed the carrier robot TR, it provides coating treatment unit SC1, SC2 and development unit SD1, and SD2.
[0018]Coating treatment unit SC1 and SC2 are what is called spin coaters that perform a uniform resist application by dropping photoresist at the substrate principal surface, rotating a substrate. Development unit SD1 and SD2 are what is called spin developers that perform a development by supplying a developing solution on the substrate after exposure. In this specification, the handling unit (for example, coating treatment unit SC1, SC2 and development unit SD1, SD2) which supplies treating solutions, such as photoresist, to a substrate and performs predetermined processing is called a liquid treatment unit.
[0019]Refrigeration unit CP2, warming unit HP4, and warming unit HP3 are provided above coating treatment unit SC1 sequentially from the heat treatment units laminated by three steps, i.e., the bottom. Similarly, above coating treatment unit SC2, refrigeration unit CP4, warming unit HP8, and warming unit HP7 are laminated sequentially from the bottom. Above development unit SD1, refrigeration unit CP1, warming unit HP2, and warming unit HP1 are laminated sequentially from the bottom. Above development unit SD2, refrigeration unit CP3, warming unit HP6, and warming unit HP5 are laminated sequentially from the bottom. In drawing 1, although the expedient upper heat treatment units of a graphic display are arranged superficially, each of these is accumulated above a liquid treatment unit. Although air conditioning unit ACU for supplying a clean air to each liquid treatment unit strictly right above a liquid treatment unit (between a liquid treatment unit and heat treatment units) is provided, the function of this air conditioning unit ACU is mentioned later.
[0020]The warming units HP1-HP8 are what is called hot plates that heat a substrate and carry out temperature up even to a predetermined temperature. The refrigeration units CP1-CP4 are what is called cool plates that maintain a substrate to the predetermined temperature concerned while they cool a substrate and lower it even to a predetermined temperature. In this specification, the handling unit (for example, the warming units HP1-HP8 and the refrigeration units CP1-CP4) which performs the temperature control of a substrate is called heat treatment units. And when only calling it a handling unit in the explanation about the substrate processing device 1, it is considered as a concept including the both sides of a liquid treatment unit and heat treatment units (however, except for an air conditioning unit).
[0021]The carrier robot TR can perform vertical movement of the perpendicular direction, and rotating operation centering on the perpendicular direction with the drive mechanism which omits a graphic display. The carrier robot TR has transportation arm AM for accessing each above-mentioned handling unit by holding a substrate and performing forward/backward moving in the level surface (drawing 2). As for transportation arm AM, it is preferred to consider it as a double arm because of the improvement in a throughput.
[0022]By carrying out circulation conveyance of the substrate between some or all of an above-mentioned handling unit with the carrier robot TR, heat treatment which accompanies the substrate concerned at resist application processing, a development, and them is performed, and a series of substrate treatment is advanced.
[0023]It explains that the air in <the air current in 2. substrate processing device>, next the above-mentioned substrate processing device 1 flows. It is the airstream in the substrate processing device 1 which the drawing 2 inner substance line arrow shows. As shown in drawing 2, the clean air feed zone 20 (air supply means) is formed in the device upper part of the substrate processing device 1 of this embodiment. The clean air feed zone 20 is provided with the following.
Chemical-absorption filter 21.

Blower fan 22.
URUPA filter 23.
The chemical-absorption filter 21 is a filter for adsorbing ammonia gas and removing it from the atmosphere to pass. The URUPA filter 23 is a filter for removing particle from the atmosphere to pass. By operating the blower fan 22, air can be incorporated from the external upper part of a device, ammonia gas and particle can be removed from the air, and defecation air (clean air) can be fed into the carrying path 10 in a device.
[0024]A part of clean air fed by the carrying path 10 flows into each heat treatment units, as shown in drawing 2. After the exhaust air which flowed into each heat treatment units passes each heat treatment units, it is discharged by the heat treatment exhaust pipe 31. After the exhaust air which the heat treatment exhaust pipe 31 was making open each heat treatment units and the device exterior (for example, factory exhaust line) for free passage, and was discharged from each heat treatment units joins with the heat treatment exhaust pipe 31, it is led to the device exterior and exhausted.
[0025]A part of clean air fed by the carrying path 10 flows also into air conditioning unit ACU. As mentioned already, air conditioning unit ACU is provided right above each liquid treatment unit. Each air conditioning unit ACU is provided with the fan 32 and the URUPA filter 33. By operating the fan 32, air is compulsorily attracted to air conditioning unit ACU from the airstream (downflow) of the clean air which flows through the carrying path 10 below. The clean air attracted in air conditioning unit ACU is supplied to a liquid treatment unit, after particle is further removed by the URUPA filter 33.
[0026]The clean air supplied to development unit SD1 (SD2) among the clean airs supplied to the liquid treatment unit from the upper part is exhausted by the device exterior (for example, factory exhaust line) via the development system exhaust pipe 36. The clean air supplied to coating treatment unit SC1 (SC2) is exhausted by the device exterior via the coating-treatments system exhaust pipe 37.
[0027]On the other hand, it is the clean air fed by the carrying path 10, and about the retained material which flowed into neither of the handling units, it flows caudad as it is, a downflow is formed, and it passes through the carrier robot's TR circumference, and results even in a device pars basilaris ossis occipitalis. The opening 38 and the ventilating fan 39 are formed in the device pars basilaris ossis occipitalis. The downflow of the clean air which continued flowing through the carrying path 10 is discharged from the opening 38 by operating the ventilating fan 39 in the device exterior (for example, under floor grating opening of a clean room).
[0028]As mentioned above, in the substrate processing device 1, the carrying path 10 and each of each handling unit in a device are opened for free passage, The defecation air fed by the clean air feed zone 20 flows through either each liquid treatment unit in a device, each heat treatment units and the carrying path 10, and is exhausted by the device exterior. That is, defecation air is supplied to the whole substrate processing device 1 by the clean air feed zone 20. And the air which flowed through either the liquid treatment unit in a device, heat treatment units and the carrying path 10 is exhausted by the device exterior through an individual course. Especially about the liquid treatment unit, the coating-treatments system exhaust pipe 37 and the development system exhaust pipe 36 are made into the independent exhaust route separated thoroughly [other exhaust routes] so that the gas constituents etc. which are contained in photoresist or a developing solution may flow backwards and it may not mix in other handling units.
[0029]Here, in the substrate processing device 1 of this embodiment, the clean air feed zone 20 supplies defecation air by the amount of supply more than the sum total displacement exhausted from two or more all and carrying paths 10 of a handling unit. While adjusting the number of rotations of the blower fan 22 to variable and specifically adjusting the clean air amount of

supply from the clean air feed zone 20 by inverter control, for example, by adjusting the path of each exhaust pipe has prescribed the displacement from each handling unit.
[0030]Therefore, the inside of the substrate processing device 1 will be in the positive pressure state where atmospheric pressure is always higher than the atmosphere (atmosphere of a clean room) of the device circumference. As a result, a possibility that the atmosphere of the device exterior containing particle may mix in the inside of the substrate processing device 1 disappears, and the inside of a device is maintained by the state always purer than surrounding clean room environment. The good downflow which goes to a lower part from the upper part of the carrying path 10 like the substrate processing device 1 also in the device of the vertical mold which laminated two or more handling units to multistage will be formed.
[0031]He once supplies defecation air to the carrying path 10 from the clean air feed zone 20, and is trying for defecation air to flow into each handling unit from the carrying path 10 in the substrate processing device 1 of this embodiment. That is, atmospheric pressure in the carrying path 10 is made more than the atmospheric pressure in each of two or more handling units. Therefore, there is no possibility that the air current turned to the carrying path 10 from each handling unit may be formed, and disclosure of the atmosphere of the photoresist solvent from developing solution atmosphere [from development unit SD1 and SD2] and coating treatment unit SC1 and SC2 can be prevented especially.
[0032]As mentioned above, although the substrate processing device 1 concerning this invention was explained, the mode of the substrate processing device 1 is not limited to the above-mentioned example. For example, although it was considered as the eight number of a warming unit and was considered as the four number of a refrigeration unit in the above-mentioned example, the number of these heat treatment units is arbitrary, and should just be taken as the number according to the contents of substrate treatment. It may be made to include the after-exposure baking unit in the adhesion strengthening unit and excimer responding device which perform adhesion strengthening treatment of a resist application sake as a warming unit.
[0033]The number of the liquid treatment units like a development unit or a coating treatment unit is also arbitrary. It may be made to include the washing handling unit which supplies pure water to a substrate other than the above as a liquid treatment unit, and performs washing processing.
[0034]It may be made to include the edge exposure unit which performs peripheral exposure of a substrate other than a liquid treatment unit or heat treatment units, for example in a handling unit. Thus, the mode of versatility [gestalt / especially / of a handling unit] of the substrate processing device 1 can be taken, this is generalized below, and it explains briefly.
[0035]The number of kinds of the handling unit in a substrate processing device is made into k kind. However, what is directly opened for free passage by the exhaust route with the device exterior, and is not directly opened for free passage with the device exterior like air conditioning unit ACU in the above-mentioned example removes a handling unit. And what is necessary is just to make it fill the relation shown in the following several 1, when the clean air amount of supply from the clean air feed zone 20 is set to S.
[0036]
[Equation 1]

$$S \geqq \sum_{i=1}^{k} n_i E_i + F$$

[0037]In several 1, n_i is the number of the handling unit of the i-th kind, E_i is the individual displacement of the handling unit of the i-th kind, and F is the displacement from a carrying path. Whenever it makes it fill several 1 relation, defecation air will be supplied by the amount of supply more than the sum total displacement exhausted from two or more all and carrying paths

of a handling unit, and the inside of a substrate processing device can be maintained to positive pressure. As a result, a good downflow can be formed in a carrying path while being able to prevent mixing of the external atmosphere into a device.
[0038]Whenever it supplies defecation air by the amount of supply more than the whole displacement which will be discharged from a substrate processing device outside if it furthermore elaborates, the inside of a substrate processing device is maintainable to positive pressure.
[0039]<3. substrate processing system>, next the substrate processing system incorporating the above-mentioned substrate processing device are explained. Generally, in a semiconductor plant, the substrate processing device like the above is unified by connecting with a pattern exposure machine (stepper) etc., and it installs in a clean room as an in-line process system in many cases. Hereafter, the classic example of such a substrate processing system made in-line is explained.
[0040]Drawing 3 is an arrangement configuration figure showing an example of a substrate processing system concerning this invention. The substrate processing devices 2 and 3 are the same as the above-mentioned substrate processing device 1 except for a point that composition contents of a handling unit differ. That is, it is the device only for resist application processing which provided four coating treatment unit SCs as put the carrying path 12 in which the substrate processing device 2 has stationed the carrier robot TR to the above-mentioned substrate processing device 1 being a device which performs both sides of resist application processing and a development. The substrate processing device 3 is a device only for a development which provided four development unit SD as put the carrying path 13 which has stationed the carrier robot TR. A function of a liquid treatment unit of the carrier robot TR and coating treatment unit SC, or development unit SD is the same as the above-mentioned substrate processing device 1. And a point that heat treatment units are arranged above a liquid treatment unit is the same as the substrate processing device 1.
[0041]The substrate processing device 2 and the substrate processing device 3 are connected in accordance with the direction of X in a figure, and the carrying path 12 and the carrying path 13 are made to open for free passage in this embodiment, as shown in drawing 3.Therefore, it is possible from the carrying path 12 to form an air current towards the carrying path 12 towards the carrying path 13 from the carrying path 13 conversely, and it is also possible to deliver a substrate among both carrier robots TR. However, from a viewpoint of atmospheric pressure balance, the substrate processing device 2 and the substrate processing device 3 are equivalent devices, and atmospheric pressure of the carrying path 12 and atmospheric pressure in the carrying path 13 are equal, and it is equal also to atmospheric pressure in a handling unit of the substrate processing device 2, and atmospheric pressure in a handling unit of the substrate processing device 3.
[0042]Indexer ID is connected to the side (it is the side of an opposite hand that the substrate processing device 3 is connected) of the substrate processing device 2. Indexer ID receives a processed substrate from the substrate processing device 2, and stores it in a career while it lays a career (graphic display abbreviation) which can store two or more substrates and pays an unsettled board to the substrate processing device 2 out of the career concerned. As a gestalt of a career, it may be OC (open casett) which puts a storage board to the open air, and may be FOUP (front opening unified pod) which stores a substrate to a closed space.
[0043]It is open for free passage and the carrying path 12 and indexer ID of the substrate processing device 2 can form an air current among both sides. Board holder delivery between indexer ID and the substrate processing device 2 is performed by the carrier robot TR installed in the carrying path 12.
[0044]Here, in this embodiment, atmospheric pressure in indexer ID is made lower than atmospheric pressure in each of two or more handling units in the substrate processing device 2

and 3. Specifically, atmospheric pressure in indexer ID is adjusted like the above-mentioned substrate processing device 1 by controlling supply exhaust air balance of exhaust air in indexer ID. And atmospheric pressure in the carrying path 12 (13) of the substrate processing device 2 (3) is more than atmospheric pressure in each of two or more handling units like the substrate processing device 1 mentioned already. Therefore, atmospheric pressure in indexer ID becomes lower than atmospheric pressure in the carrying path 12 (13) of the substrate processing device 2 (3). Therefore, an air current turned to indexer ID from the carrying path 12 (13) will be formed.
[0045]Drawing 4 is a figure showing an air current formed in a substrate processing system of drawing 3. It means that the opening part shown by () in the figure is a portion currently opened for free passage, and a solid line arrow shows direction of an air current formed. In drawing 4, they are omitting a statement of the carrier robot TR while writing a "handling unit" collectively. [a liquid treatment unit and heat treatment units]
[0046]As an air current is formed towards a low field from a field where atmospheric pressure is high and is shown in drawing 4, from the carrying path 12 (13) of the substrate processing device 2 (3), an air current towards both sides of each handling unit and indexer ID is formed. As a result, the clean room atmosphere is prevented from mixing in the substrate processing device 2 (3) further from indexer ID which clean room atmosphere mixes.
[0047]It returns to drawing 3, the interface IFB is connected to the side (it is the side of an opposite hand that the substrate processing device 2 is connected) of the substrate processing device 3, and stepper STP is further connected to the interface IFB. That is, on both sides of the interface IFB, the substrate processing device 3 and stepper STP are connected. Stepper STP is an exposure machine which performs pattern exposure on the surface of a substrate with which resist was applied. The interface IFB has the function to deliver a substrate between the substrate processing device 3 and an exposure machine.
[0048]The carrying path 13 and the interface IFB of the substrate processing device 3 are opened for free passage. Therefore, the interface IFB will be opened for free passage with indexer ID on both sides of the carrying paths 12 and 13. As for the interface IFB, stepper STP is opened for free passage. Therefore, gaseous passage is possible in the range from stepper STP to indexer ID through the interface IFB and the carrying paths 12 and 13. The interface IFB can pass the carrier robot TR of the carrying path 13 an exposure back substrate received from stepper STP while carrying in to stepper STP an exposure front substrate received from the carrier robot TR of the carrying path 13.
[0049]Atmospheric pressure in the interface IFB is made higher than atmospheric pressure in each of two or more handling units in the substrate processing device 2 and 3 here, and it is supposed that it is almost equivalent to atmospheric pressure in the carrying paths 12 and 13. Atmospheric pressure in stepper STP is made higher than atmospheric pressure in the interface IFB. Specifically, atmospheric pressure in each is adjusted like the above-mentioned substrate processing device 1 by controlling the interface IFB and supply exhaust air balance of exhaust air in each of stepper STP. Therefore, atmospheric pressure in stepper STP will become higher than which atmospheric pressure in the inside of the interface IFB and the substrate processing device 2 and 3, and indexer ID.
[0050]As a result, as shown in drawing 4, an air current of one way which passes the interface IFB and the carrying paths 12 and 13 from stepper STP, and results in indexer ID is formed. Airstream which included particle, alkali atmosphere, etc. in stepper STP as which cleanliness of the thereby highest level is required from indexer ID or the substrate processing devices 2 and 3 is prevented from flowing.
[0051]Indexer ID is in contact with the clean room passage 5. The clean room passage 5 is a passage provided in a clean room, in order that AGV (automated guided vehicle) etc. which carry a career which accommodated a substrate may pass, and it is usually an uninhabited space

at the time of processing. AGV runs the clean room passage 5, carries a substrate, and it takes out a career which stored a processed substrate from indexer ID while it carries in to indexer ID a career which stored an unsettled board.
[0052]Naturally indexer ID and the clean room passage 5 are made into a communicating state. And in this embodiment, while making atmospheric pressure in the clean room passage 5 higher than atmospheric pressure in indexer ID, it is made lower than atmospheric pressure in each of two or more handling units in the substrate processing device 2 and 3. Specifically, atmospheric pressure is adjusted by controlling air-supply-and-exhaust balance in the clean room passage 5 by an air conditioning unit of a clean room.
[0053]Thereby, as shown in drawing 4, an air current turned to indexer ID from the clean room passage 5 is formed. An air current from the carrying path 12 of the substrate processing device 2 also flows into indexer ID. As a result, while airstream which included alkali atmosphere etc. from the substrate processing devices 2 and 3 is prevented from being revealed in a clean room, it also prevents atmosphere of a clean room where cleanliness is lower than the substrate processing devices 2 and 3 flowing into the substrate processing devices 2 and 3. If it puts in another way, aeration between indexer ID and the substrate processing devices 2 and 3 is barred by carrying out indexer ID between troughs.
[0054]The operation room 7 is installed in a clean room. The operation room 7 is manned area for an operator to operate a substrate processing system. The operation room 7 is thoroughly isolated with indexer ID, the interface IFB, and stepper STP which accompany the substrate processing devices 2 and 3 and it. At the time of processing, the clean room passage 5 uninhabited in the operation room 7 is usually intercepted.
[0055]Therefore, in this embodiment, the operation room 7 makes atmospheric pressure in the operation room 7 lower than atmospheric pressure in indexer ID, although the substrate processing device 2, 3 grades, and a communicating state are not carried out. That is, the operation room 7 serves as area in drawing 3 where atmospheric pressure is the lowest.
[0056]The operation room 7 is a manned space, the cleanliness is also comparatively low, and that atmosphere of the operation room 7 is revealed needs to control as much as possible. Since the operation rooms 7 are the exterior and the isolated area, there are few possibilities that the atmosphere will be revealed, but disclosure of a low atmosphere of cleanliness can be certainly prevented by making atmospheric pressure of the operation room 7 lower than atmospheric pressure in indexer ID.
[0057]As mentioned above, although a substrate processing system concerning this invention was explained, a mode of a substrate processing system is not limited to the above-mentioned example. For example, it may replace with the substrate processing device 2 only for resist application processing, and the substrate processing device 3 only for a development, and the substrate processing device 1 shown in drawing 1 may be used.
[0058]When indexer ID is FOUP correspondence, there is not necessarily necessity of forming the uninhabited clean room passage 5.
[0059]It may be the system which used stepper STP etc. as a different body, and what is necessary is not to be limited to this, and just to constitute a substrate system suitably if needed in this case, although it was considered as a substrate processing system made in-line in the above. For example, only indexer ID can be connected to the substrate processing devices 2 and 3, and it can also be considered as one substrate processing system.
[0060]According to the contents of processing of not only linear shape arrangement but a substrate, a space situation in a clean room, etc., it can be considered as a proper gestalt about substrate processing system arrangement relationship, for example, arrangement relationship of the substrate processing devices 2 and 3 and stepper STP.
[0061]

[Effect of the Invention]As mentioned above, since defecation air is supplied by the amount of supply more than the sum total displacement exhausted from two or more all and carrying paths of a handling unit according to the invention of claim 1 as explained, the inside of a substrate processing device is always maintainable to positive pressure.
[0062]According to the invention of claim 2, two or more handling units can prevent mixing of the external atmosphere to these units including the warming unit which heat-treats to a substrate, the refrigeration unit which performs a cooling process to a substrate, and the liquid treatment unit which performs liquid treatment to a substrate.
[0063]According to the invention of claim 3, since defecation air is supplied to a carrying path and atmospheric pressure in the carrying path concerned is made more than the atmospheric pressure in each of two or more handling units, formation of the air current turned to the carrying path from each handling unit is controlled, and disclosure of a treatment atmosphere can be prevented.
[0064]According to the invention of claim 4, since the atmospheric pressure in an indexer is lower than the atmospheric pressure in each of two or more handling units, an external atmosphere is prevented from mixing in a substrate processing device via an indexer.
[0065]Since the atmospheric pressure in an interface is higher than the atmospheric pressure in each of two or more handling units according to the invention of claim 5, The airstream which included particle, alkali atmosphere, etc. in the exposure machine with which the cleanliness of a high level is demanded from the indexer or the substrate processing device is prevented from flowing.
[0066]According to the invention of claim 6, since the atmospheric pressure in an exposure machine is higher than the atmospheric pressure in an interface, the airstream which included particle, alkali atmosphere, etc. in the exposure machine with which the cleanliness of a high level is demanded via the interface is prevented from flowing.
[0067]Since atmospheric pressure in a clean room passage is made it is higher than the atmospheric pressure in an indexer, and lower than the atmospheric pressure in each of two or more handling units according to the invention of claim 7, While the airstream which included alkali atmosphere etc. from the substrate processing device is prevented from being revealed in a clean room, it also prevents the atmosphere of the low clean room of cleanliness flowing into a substrate processing device.
[0068]According to the invention of claim 8, since atmospheric pressure in the operation room for operating a substrate processing system is made lower than the atmospheric pressure in an indexer, disclosure of a low atmosphere of the cleanliness in an operation room can be prevented certainly.

[Translation done.]